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ABSTRACT

Last year, the International Society for Technology in Education (ISTE) worked to develop and improve teacher skills in the area of educational technology by creating technology performance profiles for teacher preparation. These standards were given to a group of Pennsylvania State University instructional systems graduate students who developed rubrics to assess the four categories of standards: general preparation, professional preparation, student teaching/internship, and first-year teaching. The process and methods used in the design, development and creation of these rubrics is presented and discussed. (Author/AEF)

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Designing and Developing Rubrics As An Instrument to Assess ISTE's (International Society for Technology in Education) National Educational Technology Standards for Teachers (NETS-T)

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Abstract

Last year, the International Society for Technology in Education (ISTE) worked to develop and improve teacher skills in the area of educational technology by creating technology performance profiles for teacher preparation. These standards were given to a group of PSU instructional systems graduate students who developed rubrics to assess the four categories of standards. The process and methods used in the design, development, and creation of these rubrics will be presented and discussed, and the rubrics will be available for use by the participants.

Introduction

Assessment has always been an important part of both the education and training fields. Standards are also valuable way of defining expectations, but when it comes to assessing whether standards have been achieved the plot thickens. Issues that arise concerning the reliability and validity of measurement and assessment will always be present. Assessment instruments are not always easy to design or develop. Some assessment instruments such as rubrics can be of some help. Rubrics are designed to "focus on measuring a stated objective (performance, behavior, or quality), use a range to rate performance, and contain specific performance characteristics arranged in levels indicating the degree to which a standard has been met." (Pickett) A rubric may be applied in many situations and score criteria that is, "summative, by providing information about a student's knowledge, formative, by providing information about a student's strengths and weaknesses, evaluative, by providing ways to create instruction that better fits each student's needs, and educative, by providing students with an understanding of how they learn." (Luft, 1997) Rubrics evaluate and measure a learning situation using a holistic or analytical approach that ideally results in the creation of an easy to use matrix of learning targets and the level at which these targets are achieved. The number of categories and levels of mastery is always up to the creator(s) of the rubric.

This presentation discussed the use of rubrics as an instrument to assess standards. The National Educational Technology Standards (NETS) project writing team has created and defined technology performance profiles for teacher preparation across four categories in hopes to use these profiles in the development and improvement of teacher skills and competencies in the area of educational technology (http://cnets.iste.org/pdf/nets_brochure.pdf). This project, initiated by the International Society for Technology in Education (ISTE), focused on the development of national standards for various uses of technologies that are associated with school improvement in the United States. A group of graduate students at Penn State University, taking a class based on analyzing outcomes and learners, given these standards and charged with developing assessment instruments based on the ISTE standards. This presentation explored the design and development of those assessment instruments.

The presentation began with a brief introduction and statement of objectives. We then explored the work done by the ISTE NETS writing team with the intent to engage the audience in the specific areas addressed by these standards. We then explored the four categories of standards, general preparation, professional education, student teaching/internship, and first-year teaching and the suggestions for evaluation provided by a class well versed in analyzing learners and outcomes. We looked at separate rubrics the class constructed and examined how they relate to the original standards. We discussed the design and development of these rubrics and the processes, obstacles, and methodologies in which these assessment instruments were created. The presentation ended with an open forum and a brief question and answer period between the audience and the presenters.

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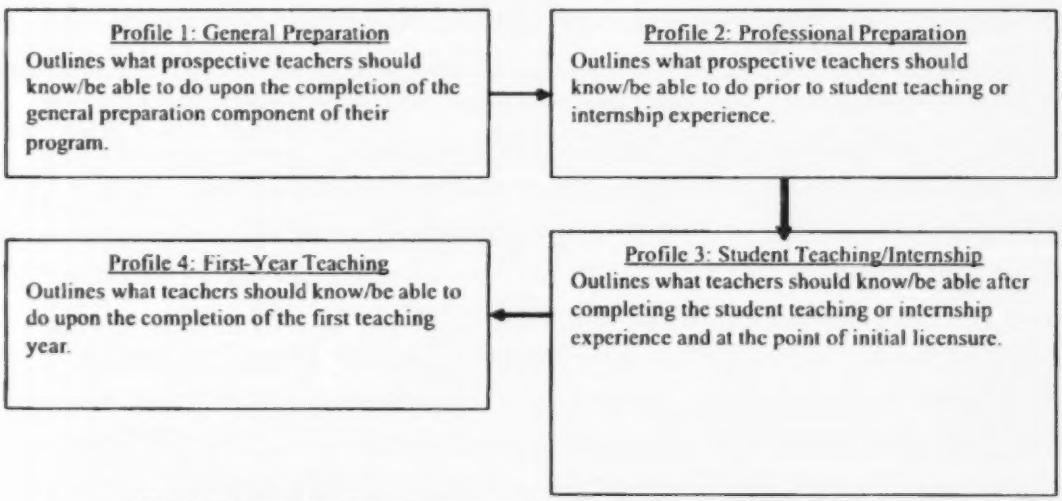
The format of this presentation recommends a refined approach, used for creating and implementing rubrics, as an appropriate instrument of assessment, specifically when evaluating performance based on the ISTE's National Educational Technology Standards. The audience was expected to offer constructive criticism and suggested ways to improve upon the processes and methods used.

The NETS-T Project

- The National Educational Technology Standards for Teachers (NETS-T) is an International Society for Technology in Education (ISTE) initiative, which seeks to prepare today's teachers-in-training to provide technology-supported learning opportunities and interventions for K-12 classrooms.
- This initiative is funded by a United States Department of Education's Preparing Tomorrow's Teachers to use Technology (PT^3) Grant, a catalyst program designed to train technology literate teachers.
- Accordingly, NETS-T defines technology knowledge and skills, as well as attitudes new teachers should possess as they proceed through their teacher preparation programs.
- Each performance standard outlined in each of the four profiles is designed to assess ISTE's National Education Technology Standards (NETS) and their corresponding Performance Indicators for teachers.
- To facilitate this process, ISTE developed four profiles of technology literate teachers, each of which details the required technology knowledge and skills at the following stages of preparation:
    - Completion of the general preparation
    - Prior to internship/student teaching experience
    - After completion of internship/student teaching
    - Upon completion of first year


Profile 1: General Preparation
Outlines what prospective teachers should know/be able to do upon the completion of the general preparation component of their program.
Profile 2: Professional Preparation
Outlines what prospective teachers should know/be able to do prior to student teaching or internship experience.
Profile 3: Student Teaching/Internship
Outlines what teachers should know/be able after completing the student teaching or internship experience and at the point of initial licensure.
Profile 4: First-Year Teaching
Outlines what teachers should know/be able to do upon the completion of the first teaching year.

*Additional details for each profile are available at http://cnets.iste.org/pdf/nets_brochure.pdf and at the ISTE website http://www.iste.org.

Why We Did It

- Kyle Peck, Ph.D., Professor of Education in Instructional Systems, assigned the assessment of the NETS-T, in partial fulfillment of a required graduate course in assessments.

- He felt that this project would both provide a real-life opportunity as well as be of practical value to ISTE's efforts, which, to that date, had not created a comprehensive assessment strategy for this initiative.

How It Was Done

- For the most part, students were able to choose the Profile that they wished to develop assessments for.
- We were given the freedom to organize the performance standards such that it was deemed manageable.
- This meant combining, re-writing, and even removing performance standards that did not fit in with the respective graduate students assessment plan.
- Accordingly, it is safe to say that no two-assessment products within each profile were the same.

Examples
Profile #2: Professional Preparation

Description

Learning Target III: Teaching, Learning and Curriculum (ISTE NETS Performance Indicators: I, III, IV,V)

Performance Objective*: **The teacher will be able to design lessons and peer teach with technology that meets the content standards and reflects the best practices in teaching and learning.***

Performance Standard: Having observed teaching practices in various schools, video demonstrations and other peer teaching, the teacher will be able to design and teach lessons that reflect the best practices in teaching and learning using technology

Assessment Method: Lesson Plans and Teaching Practice

Performance Task: Design and teach technology enriched learning activities that maximize student leaning with diverse needs.

Learning Target I

Elements of Assessment: Knowledge of Technology Concepts, Tools and their Uses.

This is a 'to do activity' for your professional development.
There are three sections numbered A, B, C. Please follow the instructions carefully.

A. Technology Concepts.

i) Assessing your conceptualization of technology-related concepts.

Directions: Work through this activity and construct your own personal concepts about technology. Circle T or F to indicate what is True or False, and write an explanation if required.

1. The terms 'medium for instruction' and 'instructional technology' are synonyms.
   T or F
2. There is a difference between interactive technologies and presentation technologies.
   T or F
3. Printed textbooks are technology tools for delivery.
   T or F

4. There is no significant difference in learner achievement between those who are taught with the Internet and those taught with traditional methods.
T or F

Explain your answer.

_____
_____
_____

ii) Assessing Personal Attitudes Towards Technology

Directions: Place an "x" on the continuum to represent your feelings towards the statements below.

1. Technology should be integrated into teaching and learning from the cradle to the grave.

Agree — Uncertain — Disagree

2. New technologies for use in the classroom are more important than traditional basic supplies.

Agree — Uncertain — Disagree

3. Computer-mediated teaching will soon make teachers redundant.

Agree — Uncertain — Disagree

4. Today's learners, who are more literate than their own teachers, threaten me.

Agree — Uncertain — Disagree

5. I am not confident with my skills to try new technologies.

Agree — Uncertain — Disagree

6. Today's learners, who are very computer savvy, are less creative than learners who are less exposed to computers.

Agree — Uncertain — Disagree

C. Technological Tools

Assess your knowledge of Technological Tools.

In the second column of the table below, place a checkmark next to the technological tools that you are comfortable using and make a cross by those you would like to be able to use. In the third column, give your comments on how you plan to improve your skills to use those tools.

Medium	Technology tools for Delivery	Comments for Improvement
Face-to-Face contact	Presentation Aids: Black or white board _____ Overhead projector_____ Data projector_____ Slide projector_____	
Text (including graphics)	Printed textbook____ Web-based textbook__ Facsimile____ Computers___ (Including a range of applications such as e-mail, electronic databases, World Wide Web hypertext documents, FTP or ASCII documents, CD-ROM)	
Audio	Audiocassette____ Radio broadcast_____ Telephone___ Computers (with related applications)____	
Video	Television Broadcast (Terrestrial, satellite or cable and including narrowcast educational television)_____ Videocassettes_____ Video disc_____ Videoconferencing___	
Integrated Multimedia	Computer-mediated learning environments____ *(This could be stand alone or networked and with numerous possible ways to access all media through a single technology)*	

Knowledge of Computer Operations

Directions: In the right-hand column, circle the letter(s) that indicate your knowledge about computer uses.
K = I Know DK = I Don't Know

Graphic User Interface	Performance Task		
Use of toolbar, menus, and dialog boxes	Locate and use features on a toolbar. Locate and select items on menus. Locate and respond to dialog boxes.	K	DK
Menu Shortcuts	Identify and use menu shortcuts.	K	DK
Selecting	Select tools and other features within a GUI.	K	DK
Click, Double Click/Right Click,	Demonstrate clicking, double-clicking, right clicking (on PC), command clicking (On MAC), and dragging.	K	DK

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Drag			
Window	Identify and use the functions of a window.	K	DK
Scrolling	Scroll up and down a window.	K	DK
Resizing	Resize a window.	K	DK
Closing	Close a window.	K	DK
Application Software	Performance Task		
Launching	Launch an application.	K	DK
Creating files	Create a file.	K	DK
Saving	Save a file.	K	DK
Common features	Identify the features that most applications have in common.	K	DK
Basic four productivity applications	**Performance Task**		
Word processing	Demonstrate the use of a word processing application.	K	DK
Spreadsheet	Demonstrate the use of a spreadsheet application.	K	DK
Database	Demonstrate the use of a database application.	K	DK
Graphics	Use a graphic application.	K	DK
File Management	**Performance Task**		
Saving a file on a hard drive	Save a file on a hard drive.	K	DK
Saving a copy of same file at different location	Save a copy of same file at different location.	K	DK
Creating file folders	Create a new file folder. Save/Move files to a folder.	K	DK
Finding a directory from a pathname	Find a directory from a pathname.	K	DK
Naming conventions	Recognize and use file -naming conventions (as they may appear on a MAC and a PC). Explain the importance of using the correct naming conventions.	K	DK
File Recovery	Identify and demonstrate the methods available to recover files and lost data.	K	DK

Teaching, Learning and Curriculum

Element of Assessment: Lesson Plan and Teaching Practice Using Technology
Performance Task: Design and Teach Technology Enriched Learning Activities That Maximize Student Learning With Diverse Needs.
Name of Rubric: Checklist for Lesson Observation and Assessment Using Interactive and Presentation Technologies

Last Name:.....**Initials:**.....
Student Id:.....
Program of Study:.....
Subject:.....**Topic:**.....
.....
Grade:..... **Date:**..... **Time:**.....
Signature of Evaluator/Observer:..... **Marks:** 5 x 2 = ... ***10 (Each element carries 2 marks)***

A. LESSON PLAN PREPARATION

DESCRIPTORS	COMMENTS

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Appropriate technological tools were chosen. Technology relevant to the topic and logically integrated in the lesson.	

B. LESSON PRESENTATION

DESCRIPTORS	COMMENTS
Effective and skillful use of technological tools Technology chosen is purposeful and gained immediate attention from the class. Achieved appropriate content of the lesson.	

C. HANDLING OF TECHNOLOGICAL EQUIPMENT

DESCRIPTORS	COMMENTS
Knew all the operations of the technological tools	

D. SENSITIVITY TO DIVERSE NEEDS

DESCRIPTORS	COMMENTS
Technology used was sensitive to the special needs of individual identities. Technological tool used communicated to different sectors of the class.	

E. GENERAL IMPRESSION OF THE STUDENT TEACHER

DESCRIPTORS	COMMENTS
Used a variety of technological tools and looked confident, enthusiastic and enjoys teaching with technology.	

AECT Presentation Conclusion

The presentations were based on the International Society for Technology in Education (ISTE) National Educational Technology Standards (NETS) for Teachers.

The class included students from varying professional backgrounds. We believe that all students, regardless of professional and academic background, found the assessment of these standards important to the success of their implementation. In evaluating these standards, most students found that creating an assessment process was difficult because it involved a great deal of compromise as well as huge amounts of time to complete the assessment of a standard.

Despite the difficulties it was an extremely rewarding process because we were given experience of the difficulties and challenges inherent in any educational assessment.

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